May - Aug 1943

I GENERAL

A. Weather Conditions:

Pishkun, Willow Creek, and Benton Lake.

Month	Snowfall	1943 Precipitation	Max.	Min.
May	12"	1.43	77	17
June	17"	6.64	76	30
July	--	1.94	86	41
Aug.	--	.48	91	51
Total	29"	10.49		

		1942		
May	11.0"	4.99	82	25
June	----	2.04	78	33
July	----	.95	91	39
Aug.	----	.22	94	35
Total	11.0"	8.20		

		1941		
May	---	2.73	86	26
June	---	2.40	96	36
July	---	1.02	94	43
Aug.	---	.88	94	36
Total	---	7.03		

		1940		
May	---	1.50	85	28
June	----	1.86	89	37
July	----	1.19	93	41
Aug.	---	.15	100	39
Total	----	4.70		

Information given in the preceeding charts has been obtained from previous reports and records kept by the United States Weather Bureau Station, maintained in connection with the County Extension Office in Choteau, Montana. A study of the tables show that precipitation during May of 1943 was less than the other 3 years listed. There were 12 inches of snowfall during May of 1943 as compared with 11 for 1942, and none for 1941 and 1940.

June of 1943 was a very unusual month. Although May and June have always brought more moisture in this area than any other months, the record made this June has never before been recorded since the operation of this station unless it was in 1916 which records were not available. Moisture in the form of snow, hail, and rain fell on 21 days during June. On June 2nd and 3rd, 17 inches of snow was measured on the ground in Choteau, containing 2.42 inches of moisture. The storm of June 2nd and 3rd was a raging wet blizzard during which temperatures went down to 30 degrees. In the rural and higher areas of this vicinity snow was much deeper, someplaces obtaining a depth of 3 feet. Some snow banks along the Choteau Augusta highway lasted up to June 20th. Moisture fell every day except 2 up to June 16, with 1.42 inches recorded on the 14th, making a total of 5.45 inches for the first 15 days.

Temperatures during July and August were cool with quite cold nights, reaching freezing points after August 15. Showers were frequent throughout all of July and August bringing the total precipitation for the period covered by this report up to 10.42, inches as compared with 8.20 for 1942, 7.03 for 1941, and 4.70 for 1940.

B. Water Conditions

Pishkun, Willow Creek and Benton Lake

Pishkun, Willow Creek and Benton narrative report ending April 30, 1943, showed all small lakes and potholes full. Precipitation during May was pretty much scattered out and not heavy enough to cause much runoff, however it was sufficient to maintain all potholes at a full stage. Temperatures during May also averaged cooler than usual, thus, the unusually large snow fields in the mountain areas did not melt as fast during May as was expected although ~~they~~ SCRCRMS were generally above normal.

During June although 76 degrees was the highest temperature recorded, mountain streams made history for the first time since 1916. Someplaces in the area streams rose 2 and 3 feet above flood stage, taking out several large Federal and State highway bridges as well as numerous county road bridges. Besides the melting of the vast snow fields in the mountain areas, streams already at flood stage were further swelled by the runoff from 6.64 inches of moisture on ground that was already filled to capacity.

Willow Creek. Natural runoff in Willow Creek Reservoir cannot be controled or diverted, thus this reservoir had to be drained down 5 feed during May and outlet gates were left open during much of June. Even than this reservoir reached a level of 4134.3 feet by June 30, which was the highest ever recorded. Up to the time the refuge manager was transfered to Minepipe (July 7), no water had been used from Willow Creek for irrigation purposes.

Information received at the end of the period from the Reclamation Office at Fairfield, Montana, showed that Willow Creek reservoir continued to raise throughout all of July, bringing the level up to 4137.7 feet on July 31. This is 3½ feet higher than the July 1 reading, and almost 11 feet higher than the July 31 reading of 1942. A study of the contour maps of Willow Creek refuge shows that with the waterlevel at 4137.7 feet approximately 40 acres of the fenced nesting area is under water. The waterlevel chart for Willow Creek also indicates an enormous amount of water was drawn out of the reservoir during August as by the end of that month it was 12 feet lower than the end of July.

Waterlevels

End of	1943	1942	1941	1940
May	4131.5	4114.0	4085.0	4124.0
June	4134.3	4125.4	4085.0	4120.5
July	4137.7	4127.1	4085.0	4085.0
August	4125.8	4127.4	4093.0	4085.0

Pishkun. Pishkun reservoir was maintained at about a constant level throughout May and June. On May 12 the guage reading was 4371.4 and on June 30 it was 4369.7. No water from the Gibson Dam on Sun River was allowed to run into Pishkun during the heavy runoff of June although some water was being let out for control measures. During July and August water levels here gradually receded as the drawing out for irrigation purposes causes a heaver drain on the reservoir than can be supplied by the feeder canal. As the needs for irrigation let up during August, water-

levels raised again. All small lakes and potholes throughout the Pishkun easement areas remained full during the period.

Waterlevels

End of	1943	1942	1941	1940
May	4369.7	4370.0	4370.4	4370.6
June	4369.7	4369.8	4364.0	4364.0
July	4355.8	4355.0	4359.5	4360.8
August	4362.0	4360.5	4364.0	4363.0

Benton Lake. This refuge has no guage for measuring water levels but when this refuge was visited on June 16 and 17 an attempt was made to get a fairly accurate estimate of the water level. With the aid of a contour map of the refuge I estimated that the shore line was somewhat above the 3615 foot contour level, which would bring the water to a depth of about 4 feet in some places, and cover an area of approximately 4620 acres. The area covered by water this year is considerably larger than the area estimated last year. No entrance could be made at any point of the refuge with a motor vehicle during May and June. On the dates mentioned above I estimated there was about 50 second feet of water flowing in Lake Creek entering Benton Lake. High water marks along this creek indicated that a stream many times as large had been entering the lake. This creek is usually dry except during periods of heavy runoff. When Benton Lake Refuge was visited on August 17, by Mr. Willis of the Regional Office, Mr. Mushbach, and myself, we noted that the shore line had receded considerably but there still remained a very large body of water.

Form NR-1

Migratory Birds

Refuge Pishkun Months of May 1 to June 30, 1943

1 Species	2 First Observed		3 Became Common	4 Peak Concentration		5 Last observed		6 Young Produced			7 Total
Common Name	Number	Date	Date	Number	Date	Number	Date	No. Broods Obsvd.	Avg. Size	Esti- mated Total	Number Using Refuge
Common Mallard				1000	5-12-43						
American Pintail				1500	5-12-43						
Lesser Scaup				1000	5-12-43						
Shoveller				500	5-12-43						
Gadwall				200	5-12-43						
Redhead				300	5-12-43						
Canvas-back				150	5-12-43						
Buffle-head				75	5-12-43						
Baldpate				100	5-12-43						
American Merganser				50	5-12-43						
Ruddy Duck				35	5-12-43						
Western Grebe				100	5-12-43						
Horned Grebe				200	5-12-43						
Holboell's Grebe				18	5-12-43						
Common Loon				16	5-12-43						
California Gulls				300	5-12-43						
American Coot				5000	5-12-43						
Great Blue Heron				25	5-12-43						
Curlew (Long-billed)				12	5-12-43						

REMARKS: (Pertinent information not specifically requested)

Because the refuge manager was transfered from Pishkun to Ninepipe leaving July 7th, information relative to items 5-6-7 cannot be obtained. All species listed with exception of Buffleheads are summer residents of this refuge and a percent of these birds have no doubt remained throughout the summer. Information from local observers indicates that yound ducks were hatching throughout all of July and up to August 15.

Form NR-1

MIGRATORY BIRDS

Refuge Willow Creek Months of May 1 to June 30, 1943

1 Species	2 First Observed		3 Became Common	4 Peak Concentration		5 Last Observed		6 Young Produced			7 Total
Common Name	Number	Date	Date	Number	Date	Number	Date	No. Broods Obsvd.	Avg. Size	Esti- mated Total	Number Using Refuge
Ruddy Duck	175	5-13-43									
Red-breasted Merganser	80	5-13-43									
Franklins Gull	26	5-13-43				26	5-13-43				
American Merganser				500	5-13-43						
Mallard				6000	5-13-43						
Pintail				3000	5-13-43						
Baldpate				1500	5-13-43						
Shoveller				350	5-13-43						
Green-winged Teal				200	5-13-43						
Cynimon Teal				20	5-13-43						
Lesser Scaup				700	5-13-43						
Buffle-head				50	5-13-43	2	6-9-43				
Redhead				60	5-13-43						
Canvas-back				150	5-13-43						
Western Grebe				120	5-13-43						
Horned Grebe				250	5-13-43						
Common Loon				9	5-13-43						
American Coot				3500	5-13-43						
Great Blue Heron				23	5-13-43						
California Gull				75	5-13-43						
Long-billed Curlew				22	6-9-43						
Killdeer				16	5-13-43						
Jack Snipe	9	6-9-43				9	6-9-43				
Northern Phalarope	26	6-9-43		26	6-9-43						

III REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Developments

1. Pishkun.

All development and maintenance work was done along by the refuge manager unless otherwise stated. This applies to to all the refuges covered by this report.

The outside latrine was remodeled on the inside and turned into a storage room for the small supplies of gasoline and oil kept at that headquarters.

Maintenance work at Pishkun consisted of 1 days work on repairing fence around the headquarters buildings, 2 days on nesting area fences, and 1 day on reseting refuge boundary marker posts. About 3 days were also spent on making minor repairs and adjustments on the trucks kept at Pishkun. These repairs were mostly in the way of rearranging tires and wheels on the trucks, taking tires into town for inflating, installing batteries, and spare tire carriers, changing oil, cleaning filters, flushing radiators, and general check of motor and chassis parts.

2. Willow Creek

During the period of May 18 to May 28 inclusive the entire refuge boundary was reposted with the new boundary markers and posts. In all 50 new posts were set. Cresote treated Juniper posts obtained at the Bison Range, were set 2½ feet deep. Ends of these posts were beveled off and given a coat of white paint and signs were put on with 2½ inch galvanized lag screws. Directional arrows were removed from the old

and put on the new ones. Old posts were taken up, hauled to Pishkun and signs removed and bolted into bundles for scrap.

Three days were also spent at Willow Creek in making repairs to the nesting area fence.

3. Benton Lake

A large refuge recognition sign was put up at Benton Lake during this period. Two days was spent in the construction of the frame work and setting up the sign.

Two fire fighting equipment cases were constructed, filled with fire fighting equipment and left 1 at the Arthur Hazeltine ranch and 1 at the Carl Hinderager ranch. Both these places border on the refuge and it was felt that fire fighting equipment would be handier and always available if it were left at these ranches instead of in caches within the refuge.

Twenty two miles of fire guard was plowed around the refuge this period. These guards were plowed one rod wide and work was done by farmers and ranchers surrounding the refuge. These men were paid for this work by a reduction in fees of economic use permits.

Arrangements, plans, and agreements were made and drawn up by the refuge manager with grazing permittees at Benton Lake for the purchase and installation of a stock watering system. This was to be a Dempster pump and windmill with a 22 foot tower, valued at $256.60 installed complete with automatic controls and water tank. When visiting the refuge on August 17 it was learned this outfit had been received in Great Falls and would be installed soon.

Benton Lake

1. Grazing

Permittee	Period	No. Head	No. AUM	Rate	Amount
* R. R. Swan	7/15 to 11/30	110	495	.30	$148.50
* Arthur Hazeltine	7/15 to 11/30	60	270	.30	81.00
* Chas Hinderager	7/15 to 11/30	90	405	.30	121.50
* John Hinkle	7/15 to 11/30	35	158	.30	47.40
Henry Suck	8/1 to 11/30	40	160	.50	80.00
**Carl Hinderager	9/10 to 11/30	75	200	.50	100.00
Total		410	1688		578.40

* These permits were issued at a reduction of fee, 30 cents per AUM being charged in liew of the regular rate of 50 cents. Permittees in this group have agreed to purchase a windmill pumping system for stock watering purposes and install it at the site of the old abandoned oil well in the north central part of the refuge. When visiting Benton Lake on August 17 it was learned the pumping system was on hand in Great Falls and was to be installed as soon as possible.

** A request for a grazing permit for 75 head of cattle was received from Carl Hinderager on August 28. The application was made out and sent him for signing and submission of down payment. Although the priveleges requested were not used during the past quarter, this application for grazing permit is included with the others inorder to show approximately how much of an income may be expected from grazing permits this year.

Since grazing was only permitted after July 15th it has not in any way interfered with the nesting of waterfowl on the refuge. Grazing has not interfered with haying operations becouse cattle feed in and along the shore line where the grasses stay green. Permittees are fencing their own hay stacks against any possible damage by cattle.

2. Haying (Unit 1)

Permittee	Approx. No. Tons Requested	Rate per Ton	Approx. Value
* Verle Ewing	65	.60	$39.00
* Carl Hinderager	60	.60	36.00
*Arthur Hazeltine	70	.60	42.00
* John Hinkle	60	.60	36.00
*Chas. Hinderager	50	.60	30.00
* Chris Hagnes	45	.60	27.00
Peter Fake	30	1.00	30.00
Lloyd Johnston	40	1.00	40.00
Edwin J. Fink	40	1.00	40.00
John Hinkle	50	1.00	50.00
Total	510		370.00

* Permits in this group were issued at a reduction of fee 60 cents per ton being charged in liew of the regular rate of $1.00 per ton, and permittees in this group have agreed to plow and maintain fire guards around the fenced boundary of Benton Lake. On August 17th it was noted that fire guards have been plowed but in most instances maintenance work was necessary to make them more effective.

The quality of the hay at Benton Lake this year was very good especially on ground that was mowed in previously years. Hay also stayed green longer than it did last year thus it was in much better condition and more desirable for livestock.

3. Other Uses (Unit 4-5-6)

In addition to Grazing and Haying permits granted in unit 1 of economic use plan, permits extending for one year were issued 3 ranchers for grazing cattle in units 4-5 and 6. These are as follows:

Peter Fake, Unit No. 4, 280 acres @ .10 cents per acre $28.00

Carl Hinderager " 5 200 " " " " " " " 20.00

Chris Hagnes " 6 280 " " " " " " " 28.00

Estimated total amount to be received from economic uses at Benton Lake this season are as follows:

Grazing - Unit 1	$578.40
Grazing - Units 4-5-6	76.00
Haying - Unit 1	370.00
Purchase of windmill and pump by permittees which when paid for will belong to the Service	265.60
Allowances for plowing and maintenance of fire guards	140.00
Total	1430.00

A free use permit for securing approximately 6000 cubic yards of gravel was also granted Cascade County, Montana for use in graveling and maintenance of the county road running through the eastern portion of Benton Lake Refuge.

V. PUBLIC RELATIONS

A. Recreational Uses

1. Pishkun

Since the outbreak of war all fishing and camping has been prohibited at Pishkun by the Reclamation Service during the heavy irrigating season. This precaution was taken as a war measure to prevent sabotage of the dikes. This year the Reclamation Service allowed Pishkun to open to fishing on a part of the reservoir on August 22. On August 30 and 31, Mr. Cecil Haufman and wife, electrician for the Montana Power Co at Choteau, Montana, visited at Minepipe. He stated he was fishing 'shkun all day the openning day and that there were at least man there that day. He also stated that everyone he ad obtained limit catches on Rainbow Trout.